Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

June 1991

NOGAP BULLETIN 1990/91 - 1991/92

Review of NOGAP Projects

Canada

NOGAP BULLETIN

1990/1991 - 1991/1992

REVIEW OF NOGAP PROJECTS

NOGAP SECRETARIAT
CONSTITUTIONAL DEVELOPMENT AND
STRATEGIC PLANNING BRANCH
NORTHERN AFFAIRS PROGRAM
INDIAN AND NORTHERN AFFAIRS
CANADA

JUNE 1991

BULLETIN DU PIPGN

1990/1991 - 1991/1992

EXAMEN DES PROJETS PIPGN

SECRÉTARIAT DU PIPGN
DIRECTION GÉNÉRALE DE
L'ÉVOLUTION CONSTITUTIONNELLE ET
DE LA PLANIFICATION STRATÉGIQUE
PROGRAMME DES AFFAIRES DU NORD
MINISTÈRE DES AFFAIRES INDIENNES
ET DU NORD CANADIEN

JUIN 1991

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NOGAP Bulletin

REVIEW OF NOGAP PROJECTS 1990/91 AND 1991/92

I THE PROGRAM AND ITS ADMINISTRATION

This report is the fourth review of Northern Oil and Gas Action Program (NOGAP) projects, updating the third bulletin issued in May 1977. It provides a brief description of NOGAP-funded projects to be started or continued during the fiscal years 1990/91 and 1991/92 [1].

One of NOGAP's operating objectives is to make its activities widely know. This volume is issued in support of this objective. It was compiled by the NOGAP Secretariat, Indian and Northern Affairs Canada. As noted below the program was not fully operational during the fiscal years 1988/89 and 1989/90. The replanning and repriorization exercise required to reactivate the program, was not completed until well into the first extension year (1990/91). As a consequence no bulletin was issued in May 1990. The NOGAP Secretariat chose to issue this bulletin to cover both fiscal years.

[1] Three bibliographies of work published from the beginning of NOGAP in 1984 to March 1989 have been prepared (Volume I, August 1986 and Volume II, March 1987, Volume III, March 1989 and sent to those receiving this report.

Bulletin du PIPGN

EXAMEN DES PROJETS PIPGN (1990-1991 ET 1991-1992)

I APERÇU DU PROGRAMME ET DE SON ADMINISTRATION

Ce rapport, quatrième examen des projets du Programme d'initiatives pétrolières et gazières dans le Nord (PIPGN), est une mise à jour du troisième bulletin, publié en mai 1977; il donne un aperçu des projets, financés par le PIPGN, qui seront entrepris ou poursuivis au cours des exercices 1990-1991 et 1991-1992 [1].

La publicité de son activité figure parmi les objectifs opérationnels du PIPGN et motive la publication du présent volume, rédigé par le Secrétariat du PIPGN, Affaires indiennes et du Nord canadien. Tel qu'indiqué ci-dessous, le programme n'a pas fonctionné à plein au cours des exercices 1988-1989 et 1989-1990, tandis que la replanification et le rééstablissement des priorités dans le cadre de la réactivation du programme ont pris fin alors que la première année de prolongation (1990-1991) était déjà bien avancée. Ainsi, le bulletin n'est pas paru en mai 1990; le Secrétariat du PIPGN a choisi d'en publier un pour les deux exercices financiers.

[1] Trois bibliographies des documents publiés depuis les débuts du PIPGN, en 1984, jusqu'à mars 1989, ont été adressées aux destinataires du présent rapport (volume I : août 1986; volume II : mars 1987; volume III : mars 1989).

THE PROGRAM

NOGAP was originally designed as a seven-year (1984/85 to 1990/91) research and planning program to advance the state of federal and territorial government preparedness for major hydrocarbon development north of 60°. This time frame was amended in December 1989 to spread the program's work over an additional year. Since the program was dormant for the years 1988/89 and 1989/90 (except for "A" base work), the program is now scheduled to run until 1993/94.

The program is derived from the first facet of the federal government's dual-faceted northern hydrocarbon development strategy, that is:

Implementing a federal/territorial coordinated and accelerated socio-economic, environmental and technical research and planning program to support government regulatory, policy and program responsibilities and to achieve a state of preparedness for northern hydrocarbon production.

Government preparedness for northern hydrocarbon production refers generally to acquiring the knowledge and analytical capability to make appropriate decisions concerning major northern development proposals. Preparedness requires the ability to evaluate environmental impacts and mitigate adverse ones; to develop guidelines and techniques to minimize hazards; to plan for additional public services and infrastructure, and to implement means of enhancing northern

LE PROGRAMME

À l'origine, le PIPGN était conçu comme un programme de recherche et de planification, étalé sur sept ans (1984-1985 à 1990-1991), qui aiderait les gouvernements fédéral et territoriaux à préparer les gros projets de mise en valeur des hydrocarbures au nord du 60e parallèle. Une année supplémentaire a été accordée au programme en décembre 1989; vu qu'il était «en veilleuse» en 1988-1989 et en 1989-1990 (exception faite des travaux sur les Services votés), il doit se poursuivre jusqu'en 1993-1994.

Ce programme relève du premier des deux volets de la stratégie fédérale de mise en valeur des hydrocarbures dans le Nord, soit :

Mettre en oeuvre un programme fédéral-territorial coordonné et accéléré de recherche et planification socio-économiques, environnementales et techniques, en vue d'appuyer les règlements, politiques et programmes gouvernementaux, et de se préparer à la production des hydrocarbures dans le Nord.

Par «se préparer à la production des hydrocarbures dans le Nord», on entend généralement les connaissances et outils analytiques permettant de prendre de saines décisions sur les grands projets dans le Nord, c'est-à-dire la capacité d'évaluer les répercussions sur l'environnement, d'en atténuer les dommages, d'élaborer des lignes directrices et techniques pour réduire les risques, de planifier l'implantation de services publics et

opportunities and benefits from hydrocarbon development.

NOGAP was approved by the federal Cabinet in February 1984 as a seven-year program (1984/85 to 1990/91), with initial funding approved to March 31, 1988. Following the major expenditure reduction by the federal government in November 1984, funding was reduced by 43% to $11 million in 1985/86 and in 1986/87, and $9.6 million in 1987/88 (in $1984/85). In December 1989 the Treasury Board approved a four-year extension to the program and provided funding in the amount of $8.5 million (in $1990/91) for the first two years. The funding for the last two years of the program ($11.7 million) will be the subject of further request to the Treasury Board in the fall of 1991.

NOGAP funds may be used either to accelerate work on current projects or to undertake new activities which existing ("A" base) resources cannot accommodate. Projects are proposed by NOGAP participants to support their needs for accelerated research and planning relevant to northern hydrocarbon development. They are undertaken within the context of generic development scenarios that have been adopted for the program.

NOGAP was completely replanned in 1985 because of the major budget reduction. Two factors played a major role in reorienting the program. First, the recommendations contained in the 1984 report of the Beaufort Environmental Assessment and Review Process Panel

infrastructures, et de trouver moyen de profiter des occasions qu'engendre la mise en valeur des hydrocarbures.

Approuvé en février 1984 par le Cabinet fédéral en tant que projet septennal (1984-1985 à 1990-1991), et doté d'un financement initial approuvé jusqu'au 31 mars 1988, le PIPGN a vu son financement réduit de 43 % (11 millions en 1985-1986 et en 1986-1987, puis 9,6 millions (de 1984-1985) en 1987-1988)) lors des fortes coupures des dépenses annoncées par Ottawa en novembre 1984. En décembre 1989, le Conseil du Trésor approuvait une prolongation de quatre ans, contribuant un financement de 8,5 millions (dollars de 1990-1991) pour les deux premières années; une présentation sera faite au Conseil du Trésor à l'automne de 1991 pour les deux dernières années du programme (11,7 millions).

Les fonds consentis au PIPGN servent soit à accélérer les projets actuels, soit à en entreprendre de nouveaux que ne peuvent satisfaire les ressources actuelles (services votés). Les participants proposent les projets en fonction de l'accélération de la recherche et de la planification qu'appelle la mise en valeur des hydrocarbures; leur exécution respecte les critères généraux de mise en valeur adoptés pour ce programme.

Les coupures budgétaires ont entraîné le remaniement du PIPGN en 1985, en fonction, pour l'essentiel, de deux critères : les recommandations du rapport de 1984 de la Commission d'évaluation et d'examen environnemental de la mer de Beaufort

were considered in redefining projects. Secondly, the generic development scenarios on which NOGAP work is based were priorized and modified. These scenarios relate both to production regions (the Beaufort Sea and the Arctic Islands) and to transportation modes (pipeline and tanker). In 1990 the program was again replanned, and NOGAP projects were "fine tuned" and repriorized to concentrate on Beaufort Sea production and pipeline transportation. Some projects which were already in progress from prior years may to some extent, be based on previous production and transportation scenarios.

pour la redéfinition de projets, et l'établissement de priorités et la modification des scénarios généraux qui sont à la base de l'oeuvre du PIPGN. Les scénarios portent sur les régions productrices (mer de Beaufort et îles de l'Arctique) et sur les modes de transport (pipe-lines et pétroliers). Le programme a été planifié à nouveau en 1990, les projets PIPGN étant mis «au point» et en ordre de priorité, après qu'on eut décidé de se concentrer sur la mer de Beaufort et sur le transport par pipe-lines. Certains projets en chantier depuis des années feront partiellement appel aux scénarios précédents pour la production et le transport.

With the exception of the carryovers noted above, NOGAP projects for the final four years have been focused on Beaufort Sea-Mackenzie Delta oil and gas development involving on-shore and off-shore production with transportation through a pipeline corridor.

À l'exception de ces derniers, les projets PIPGN des quatre dernières années mettent l'accent sur la mise en valeur pétrolière et gazière, tant sur terre qu'au large, dans la mer de Beaufort et le delta du Mackenzie, et sur le transport dans un «corridor de pipe-line».

This focus has been adopted given a number of other extraneous factors which may influence either directly or indirectly the direction and pace of oil and gas development in the north. Some of these factors are:

Cela est attribuable à plusieurs facteurs externes, qui peuvent influer directement ou indirectement sur l'orientation et le rythme de mise en valeur pétrolière et gazière dans le Nord. En voici certains :

- The National Energy Board decision (NEB) of August 1989 which granted Esso Resources Ltd., Shell Canada Ltd., and Gulf Canada Resources an exportlicence for 260 billion m^3 of gas.

- La décision de l'Office national de l'énergie (ONE), en août 1989, accordant à Esso Ltée, à Shell Canada Ltée et à Gulf Canada un permis d'exportation pour 260 milliards^3 de gaz.

- o Oil spills in other geographic areas.
- o IFA – Environmental Impact Review Board.
- o Persian Gulf crisis.

It is presumed, based on these and other factors, that natural gas production and pipeline transportation could begin as early as 1998. The program is reviewed annually and projects are modified and repriorized so that they reflect, within their generic framework, the most likely development scenarios.

NOGAP PARTICIPANTS

Five federal departments are currently funded under NOGAP:

1) Energy, Mines and Resources Canada – Geological Survey of Canada;
2) Environment Canada – Conservation and Protection, Atmospheric Environment Service;
3) Fisheries and Oceans – Pacific and Freshwater Fisheries, Science;
4) Indian and Northern Affairs Canada – Natural Resources and Economic Development;

- o Les fuites de pétrole dans d'autres lieux géographiques.
- o CDI – Conseil d'examen des répercussions environnementales.
- o Crise du Golfe Persique.

On estime, d'après ces facteurs (entre autres), que la production de gaz naturel et le transport par pipe-lines pourrait commencer dès 1998. Le programme est réexaminé chaque année, et les projets modifiés et remis en ordre de priorité de sorte que leur structure générale soit fonction des scénarios de mise en valeur les plus probables.

PARTICIPANTS AU PIPGN

Le PIPGN finance actuellement cinq ministères fédéraux :

1) Énergie, Mines et Ressources Canada – Commission géologique du Canada;
2) Environnement Canada – Conservation et protection, Service de l'environnement atmosphérique;
3) Pêches et Océans – Pêches dans le Pacifique et en eaux douces, Sciences;
4) Affaires indiennes et du Nord canadien – Ressources naturelles et développement économique;

5) Communication Canada, Canadian Museum of Civilization – Archaeological Survey of Canada;

The territorial governments also receive NOGAP funds. In the Yukon, the Departments of: Tourism, Renewable Resources, Education and Economic Development, Mines and Small Business participate. The Government of the Northwest Territories' participation involves the Departments of: Energy, Mines and Petroleum Resources; Transportation; Social Services; Justice; Renewable Resources; Health and Culture and Communications (through the Prince of Wales Northern Heritage Centre).

A small NOGAP Secretariat in the Constitutional Development and Strategic Planning Branch, Indian and Northern Affairs Canada provides overall management and coordination of the program among the seven participants.

NOGAP CONTRACT WORK

The majority of NOGAP projects are contracted out in whole or part. For federal departments, contracting out is usually done through requests for proposals (RFPs), which are managed by Supply and Services Canada (SSC). These RFPs are sent to potential bidders identified by both the Federal Department and the computerized sourcing system within SSC. Persons interested in obtaining further information about SSC contracting policies and procedures and access to the SSC Procurement Opportunities Board (EBB) should contact

5) Communications Canada, Musée canadien de la civilisation – Commission archéologique du Canada.

Le PIPGN fait aussi des versements aux gouvernements des Territoires. Les ministères suivants y participent au Yukon : tourisme, ressources renouvelables, éducation et développement économique, mines et petites entreprises; et, dans les Territoires du Nord–Ouest : énergie, mines et ressources pétrolières, transports, services sociaux, justice, ressources renouvelables, hygiène et culture, et communications (par l'intermédiaire du Prince of Wales Northern Heritage Centre).

La gestion et la coordination du programme parmi les sept participants est assurée par un petit Secrétariat du PIPGN, au sein de la direction générale de l'Évolution constitutionnelle et de la planification stratégique, Affaires indiennes et du Nord canadien.

PROJETS PIPGN ATTRIBUÉS À CONTRAT

La plupart des projets du PIPGN sont exécutés en partie ou entièrement à contrat. Les ministères fédéraux se servent le plus souvent de demandes de propositions, administrées par Approvisionnements et Services Canada (ASC), qui sont adressées aux soumissionnaires inscrits à la fois au ministère fédéral et dans le système informatique d'ASC. Pour tout renseignement complémentaire sur les politiques et marches à suivre d'ASC à ce sujet, ou au sujet de l'inscription au Tableau des projets de marchés (TPM),

the Science and Professional Services Directorate, Science Program Branch, Supply and Services Canada, Hull, Quebec, K1A 0S5, (819) 956-1666.

Individuals and firms contacting the phone number noted above will be advised of the name of the appropriate Supply and Services Canada Science Procurement officers for their NOGAP research areas of interest.

For the territorial governments, individuals or firms interested in obtaining further information on contracts and contracting procedures should contact the persons named in the final two sections of this paper, which describe the projects of the Government of the Yukon and the Government of the Northwest Territories.

Funding for NOGAP projects has been allocated to the end of the specific project or 1993/94, whichever comes first. Consequently, contracts for many of the projects have already been let. Information on contract status may be obtained from the individuals listed in part II.

FOR FURTHER INFORMATION

1. For general information on the entire program, contact: Bruce McLennan, Senior Planning Coordinator, NOGAP Secretariat, Constitutional Development and Strategic Planning Branch, Indian and Northern Affairs Canada, Les Terrasses de la Chaudière, Ottawa,

communiquer avec la direction générale des Sciences et des services professionnels (division des sciences), Approvisionnements et Services Canada, Hull (Québec) K1A 0S5, (819) 956-1666.

On communiquera aux particuliers et entreprises qui composent ce numéro le nom des agents d'Approvisionnements et Services Canada qui sont en charge de leur domaines de recherches pour le PIPGN.

Les particuliers et entreprises qui désirent des précisions sur les contrats et leur mode d'attribution pour les gouvernements des Territoires communiqueront avec les personnes nommées dans les dernières parties de ce document, où sont décrits les projets des gouvernements du Yukon et des Territoires du Nord-Ouest.

Les projets PIPGN seront financés jusqu'à leur terme ou jusqu'en 1993-1994, selon la première de ces éventualités; il en résulte que la plupart des contrats sont déjà décernés. Pour toute précision sur l'état des contrats, communiquer avec les personnes dont le nom figure à la partie II.

RENSEIGNEMENTS COMPLÉMENTAIRES

1. Renseignements généraux sur le programme : Bruce McLennan, Coordinateur principal de la planification, Secrétariat du PIPGN, Évolution constitutionnelle et planification stratégique, Affaires indiennes et du Nord canadien, Les Terrasses de la Chaudière, Ottawa

Ontario, K1A 0H4, (819) 997-8293, Fax No. (819) 997-0552.

2. For general information on the program of individual participants, contact the relevant NOGAP Coordinator, as follows:

Indian and Northern Affairs Canada: Rick Hurst, Environmental Studies and NOGAP Coordinator, Natural Resources and Economic Development Branch, Indian and Northern Affairs Canada, Les Terrasses de la Chaudière, Ottawa, Ontario, K1A 0H4, (819) 994-0348, Fax No. (819) 994-1460.

Fisheries and Oceans: Ken Yuen, Chief, Oceanographic Sciences Directorate, Fisheries and Oceans, 200 Kent Street, Ottawa, Ontario K1A 0E6, (613) 990-0311, Fax No. (613) 996-9055.

Environment Canada: Gordon Kerr, Director, Corporate Affairs, Western and Northern Region, Environment Canada, Twin Atria #2, 4999 - 98th Avenue, Edmonton, Alberta, T6B 2X3, (403) 468-8062, Fax No. (403) 495-2615.

Energy, Mines and Resources Canada: Dr. Langley Muir, Office of Energy Research and Development, Energy, Mines and Resources Canada, 580 Booth Street, Ottawa, Ontario, K1A 0E4, (613) 995-5299, Fax No. (613) 995-6146.

(Ontario) K1A 0H4, (819) 997-8293, n° de télécopieur : (819) 997-0552.

2. Renseignements généraux sur le programme d'un participant individuel : communiquer avec le coordonnateur PIPGN intéressé, comme suit :

Affaires indiennes et du Nord canadien : Rick Hurst, Études environnementales et coordonnateur PIPGN, direction générale des Ressources naturelles et du développement économique, ministère des Affaires indiennes et du Nord canadien, Les Terrasses de la Chaudière, Ottawa (Ontario) K1A 0H4, (819) 994-0348, n° de télécopieur : (819) 994-1460.

Pêches et Océans : Ken Yuen, Chef, direction des Sciences océanographiques, Pêches et Océans, 200, rue Kent, Ottawa (Ontario) K1A 0E6, (613) 990-0311, n° de télécopieur : (613) 996-9055.

Environnement Canada : Gordon Kerr, directeur, Affaires ministérielles, région de l'Ouest et du Nord, Environnement Canada, Twin Atria #2, 4999 - 98th Avenue, Edmonton (Alberta) T6B 2X3, (403) 468-8062, n° de télécopieur : (403) 495-2615.

Énergie, Mines et Ressources Canada : D' Langley Muir, Bureau de recherche et développement énergétiques, Énergie, Mines et Ressources Canada, 580, rue Booth, Ottawa (Ontario) K1A 0E4, (613) 995-5299, n° de télécopieur : (613) 995-6146.

Canadian Museum of Civilization: Dr. Jacques Cinq Mars, Chairman, NOGAP, Archaeological Survey of Canada, Canadian Museum of Civilization, 100 Laurier Street, Station B, P.O. Box 3100, Hull, Quebec, J8X 4H2, (819) 953-8889, Fax No. (819) 953-9382.

Government of the Northwest Territories: Lorne Matthews, Regional Planning Advisor, Energy, Mines and Resources Secretariat, Government of the Northwest Territories, P.O. Box 1320, Yellowknife, N.W.T., X1A 2L9, (403) 873-7588, Fax No. (403) 873-0254.

Government of the Yukon: Lucy-Ann Bouwman, NOGAP/EDA Coordinator, Department of Economic Development, Mines and Small Business, P.O. Box 2703, Whitehorse, Yukon, Y1A 2C6, (403) 667-7997, Fax No. (403) 668-6205.

3. For information on specific projects, see the contacts in part II.

II NOGAP PROJECTS BY PARTICIPANTS

PROJECT INFORMATION

Each of the research and planning project funded by NOGAP during 1990/91 and 1991/92 is summarized in the following sections by:

Musée canadien de la civilisation : Dr Jacques Cinq-Mars, président, PIPGN, Commission archéologique du Canada, Musée canadien de la Civilisation, 100, rue Laurier, succursale B, B.P. 3100, Hull (Québec) J8X 4H2, (819) 953-8889, n° de télécopieur : (819) 953-9382.

Gouvernement des Territoires du Nord-Ouest : Lorne Matthews, conseiller régional de la planification, Secrétariat d'Énergie, mines and ressources, gouvernement des Territoires du Nord-Ouest, P.O. Box 1320, Yellowknife (T.N.-O.) X1A 2L9, (403) 873-7588, n° de télécopieur : (403) 873-0254.

Gouvernement du Yukon : Lucy-Ann Bouwman, coordonnatrice PIPGN/EDE, ministère du développement économique, Mines et petites entreprises, P.O. Box 2703, Whitehorse (Yukon) Y1A 2C6, (403) 667-7997, n° de télécopieur : (403) 668-6205.

3. Précisions sur des projets individuels : voir les personnes-ressources à la partie II.

II PROJETS PIPGN, PAR PARTICIPANT

RENSEIGNEMENTS SUR LE PROJET

Les parties qui suivent résument chacun des projets de recherche et planification financées par le PIPGN en 1990-1991 et en 1991-1992, en fonction de ce qui suit :

- department and territorial government/department,
- title and NOGAP project number,
- the intended length of the entire project (in brackets),
- objectives,
- titles of subprojects being undertaken during 1987/88, and
- contacts, including those for individual projects, where applicable.

- ministère et gouvernement territorial;
- titre et numéro de projet PIPGN;
- durée prévue pour l'ensemble du projet (entre parenthèses);
- objectifs;
- titres des sous-projets entrepris en 1987-1988;
- personnes-ressources (y compris, s'il y a lieu, ceux pour des projets précis).

INDIAN AND NORTHERN AFFAIRS CANADA

INDIAN AND NORTHERN AFFAIRS CANADA

A.

1. **PROJECT TITLE:**

NOGAP Project A4: Granular Resources Inventory and Management Program (1984/85 - 1987/88 and 1990/91 - 1993/94).

2. **PROJECT MANAGER:**

Robert J. Gowan
Geotechnical Advisor, Land Management Division
Natural Resources and Economic Development Branch
Indian and Northern Affairs Canada
6th Floor, Les Terrasses de la Chaudière
10 Wellington Street
Hull, Quebec K1A 0H4
Tel. No. (819) 994-7464
Fax No. (819) 997-1587

3. **OBJECTIVES:**

1) To ensure that adequate geotechnical, hydrographic and other scientific and technical information is available to support the department's granular resources management program related to anticipated Mackenzie Delta - Beaufort Sea hydrocarbon development scenarios.

2) To provide detailed information on the location, type, quantities and qualities of each significant borrow source in the Mackenzie Valley and Beaufort - Mackenzie Regions as is required to support conservation and utilization strategies and policies, regional land use planning and decision-making related to hydrocarbon development.

3) To prepare recommendations based on the results of the scientific and technical programs completed under the A4 project regarding appropriate management strategies and a revised regulatory regime.

Subprojects:

A4-24 Collection and Interpretation of Selected Regional and Site Specific Bathometric and Geophysical Data for the Beaufort Sea (1991/92 - 1993/94).

A4-25 Beaufort Sea Region Granular Resources Database - Maintenance and Evaluation (1990/91 - 1993/94).

A4-26 Updating and Analysis of Beaufort Region Granular Resource Supply/Demand Data (1990/91 - 1993/94).

A4-27 Geotechnical Investigation of Selected Granular Resource Prospects, Beaufort Sea (1992/93).

A4-28 Investigation of Environmental Effects of Granular Resource Development, Selected Sites, Beaufort Sea (1992/93 - 1993/94).

A4-29 Development of Beaufort Region Granular Resource Strategy (1993/94).

B.

1. **PROJECT TITLE:**

NOGAP Project A7: Environmental Monitoring Program (1990/91 - 1993/94).

2. **PROJECT MANAGER:**

Rick Hurst
Manager
Environment and Renewable Resources
Natural Resources and Economic Development Branch
Indian and Northern Affairs Canada
6th Floor, Les Terrasses de la Chaudière
10 Wellington Street
Hull, Quebec
Tel. No. (819) 994-0348

3. **OBJECTIVES:**

1) To provide government with a comprehensive planning and review framework for environmental monitoring and research which addresses the potential impacts of hydrocarbon development and transportation in the western arctic.

2) to provide a structural and iterative process for evaluating ecological monitoring studies which are designed to detect environmental impacts resulting from current and anticipated oil and gas development activities.

3) To provide the basic framework for research projects which are essential for the progressive development and evaluation of the monitoring programs and mitigative measures being employed by industry and government.

Subprojects:

A7-12 Environmental Monitoring Program Management. Duration 1990/91 - 1993/94 (continued from 1984).

A7-13 Environmental Monitoring Program: Research.

A7-13 Beaufort Sea Oil: Research and Monitoring in Response to Inuvialuit Environmental Impact and Review Board (EIRB) Recommendations.

C.

1. **PROJECT TITLE:**

NOGAP Project A12: Contaminants in the Aquatic Environment and Quality of Aquatic Food Species (1990/91 - 1993/94). (819) 994-6484

2. **PROJECT MANAGER:**

Russel Shearer
Environmental Physical Scientist

Rick Hurst, Manager
Environment and Renewable Resources
Natural Resources and Economic Development Branch
Indian and Northern Affairs Canada
6th Floor, Les Terrasses de la Chaudière
10 Wellington Street
Hull, Quebec
Tel. No. (819) 994-0348

3. **OBJECTIVES:**

To evaluate the impact of oil and gas activities on the quality of the aquatic environment and on those species which are of importance to the survival of higher trophic levels harvested by northerners, by:

1) Increasing the data base required to assess the effects of hydrocarbon resource developments and of natural oil seeps on the environment and in particular on the traditional food sources and lifestyle of the northern natives.

2) integrating knowledge of known hydrocarbon-related effects on aquatic species and evaluating the potential impact on traditionally harvested resources; and

3) Distinguishing between petroleum hydrocarbon-related effects on the Beaufort Sea/Mackenzie River environment and other effects (eg. long-range transport of contaminants).

Subprojects:

A12-6 Contaminant Pathway Modelling of Chlorinated and Non-Chlorinated Hydrocarbons in the Mackenzie River and Beaufort Sea Shelf (1990/91 - 1993/94).

A12-7 Synthesis of Studies to Determine the Relative Importance of Hydrocarbons on the Overall Health of Mackenzie River/Beaufort Sea Shelf.

D.

1. **PROJECT TITLE:**

NOGAP Projects A13, C9: Effects of Beaufort Sea hydrocarbon development on the Porcupine Caribou Herd (1990/91 - 1993/94).

2. **PROJECT MANAGERS:**

Don Russell
Canadian Wildlife Service
Environment Canada
202-204 Range Road
Whitehorse, Yukon Y1A 3V1
Tel. No. (403) 668-2285

Connie Downes
Terrestorial Ecologist
Environment and Renewable Resources Branch
Indian and Northern Affairs Canada
6th Floor, Les Terrasses de la Chaudière
Hull, Quebec K1A 0H4
Tel. No. (819) 997-9622

3. **OBJECTIVES:**

1) To establish a monitoring program that will relate changes in range quality to changes in physical condition of the porcupine caribou.

2) To relate physical condition of caribou to the population dynamics of the herd.

3) To use the results of the above to evaluate and refine the existing computer model which will be the key management tool in predicting and monitoring the effects of development on the herd.

Subprojects:

C9.1 Monitoring of Range Quality.

C9.2 Monitoring of Physical Condition.

A13.6 Linkage between Physical Condition and Herd Productivity.

A13.7 Validation and Update of Predictive Model.

E.

1. **PROJECT TITLE:**

NOGAP Project A17: Ground Thermal Regimes and Terrain Stability, MacKenzie Valley (1990/91 - 1993/94).

2. **PROJECT MANAGERS:**

K. MacInnes
Land Resources Division
Indian and Northern Affairs Canada
Yellowknife, N.W.T. X1A 2R3
Tel. No. (403) 920-8152
Fax No. (403) 920-4669

D.E. Lawrence (Ottawa INAC Contact)
Tel. No. (819) 994-7454
Fax No. (819) 997-0511

3. **OBJECTIVES:**

The main focus of the project is to identify practical improvements which might be made in the planning, construction, operation, monitoring and abandonment of northern pipelines with special reference to the assessment and mitigation of environmental impacts, including potential impacts of the environment on the pipeline such as significant pipe movement.

Subprojects:

A.17-1 Ground Thermal Regimes in the Vicinity of the Norman Wells Pipeline.

A.17-2 Soil Climates of the Mackenzie Valley, N.W.T.

A.17-3 Slope Stability and Soil Properties.

F.

1. **PROJECT TITLE:**

NOGAP Project A20: Water Management: Preparation for Mackenzie Valley Pipeline (1990/91 - 1993/94).

2. **PROJECT MANAGERS:**

J. Letourneau, Regional Manager, Water Resources; and
B. Grey, Head Water Management and Planning
Renewable Resources and Environment
Indian and Northern Affairs Canada
Yellowknife, N.W.T.
Tel. No. (403) 920-8240
Fax No. (403) 873-5763

3. **OBJECTIVES:**

To identify practical opportunities, constraints and limitations in the siting, design, construction and operation of future Mackenzie Valley pipeline(s) with specific reference to hydrology, ground water and ice. To improve regulatory decision making with respect to pipeline planning and environmental mitigation, and to improve the ability to predict potential sites of concern for pipeline instability, particularly at river crossings. The project will address water related concerns by:

1) Analyzing satellite microwave data, land use data and snow survey data to improve the satellite microwave estimation of snow in the Mackenzie River Basin.

2) Consolidating and analyzing existing hydraulic design data (bed material, flooding, ice, ice jams and erosion), and collecting supplementary data to improve predictions.

3) Mapping areas of surface discharge of ground water and major river icings; and

4) Mapping and determining the extent of ground ice particularly at potential river crossings.

Subprojects:

A20-17 Satellite Snow Measurement.

A20-18 Hydrologic Analysis of River Basins to be crossed by the potential Mackenzie Vailey Pipeline.

A20-19 Distribution of ground water discharge zones, and associated icings in the Mackenzie Valley Delta to Norman Wells - and potential interaction with a pipeline.

A20-20 Survey of river channels on pipeline route (vicinity of Mackenzie delta) to identify locations of major ground ice.

FISHERIES AND OCEANS

FISHERIES AND OCEANS

A.

1. **PROJECT TITLE:**

NOGAP project B1 (continuing): Effects of vessel noise and traffic on Arctic marine mammals. Commenced 1984/85; 10 years + horizon. Requested through 1993/94.

2. **PROJECT MANAGER:**

Dr. Susan E. Cosens
Fisheries Research Division
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Tel. No. (204) 983-8838

3. **OBJECTIVES:**

To enhance the Department's capability to provide timely and credible scientific advice regarding the interaction between Arctic marine mammal populations and hydrocarbon development, production and transportation, specifically:

1) To develop an experimental database on behaviourial and distributional responses of marine mammals to underwater ship noise.

2) To develop knowledge regarding the production, propagation and perception of underwater sounds produced by marine mammals.

3) To predict the short and long-term sensitivity and vulnerability of marine mammals to disturbance by vessel traffic.

4) To be in a position to advise on vessel operation so as to minimize negative effects on Arctic marine mammals.

Subprojects:

B.1.4 Responses of marine mammals to vessel noise.

B.1.5 Assessment of potential masking of marine mammal sounds by ship noise.

B.1.6 Evaluation of disturbance of ringed seal distribution and behaviour in response to ship traffic.

B.

1. **PROJECT TITLE:**

NOGAP project B2: Critical estuarine and marine habitats of the Canadian Arctic Coastal Shelf. Commenced 1984/85. Approved through 1991/92. Requested through 1993/94.

2. **PROJECT MANAGER:**

G. Hopky
Resource Allocation and Habitat Management Division
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Tel. No. (204) 949-5222

3. **OBJECTIVES:**

This project has encompassed six subprojects; additional work on four of these is not envisaged under NOGAP. Two of the subprojects are proposed for continuation, for furtherance of three of the originally-stated Project B.2 main objectives:

1) To identify some estuarine and marine habitats of significance to fish and marine mammals on the Beaufort Shelf, and to arctic cod in the Northwest Passage.

2) To characterize these habitats in terms of biotic community composition and abiotic parameters, and

3) To improve our understanding of ecosystem processes and pathways in these habitats in terms appropriate to backgrounding the assessment of sensitivity and vulnerability of estuarine and marine fish and their habitats to hydrocarbon production and transportation from the Beaufort Shelf.

Particular sub-objectives for the proposed continuation are:

4) To complete archiving of all records (approximately 200,000 entries) generated from research activities on the Beaufort Shelf during 1984/85 - 1987/88, in readily-accessible format and pertaining to plankton, oceanographic, marine and estuarine fish, and benthic invertebrate data.

5) To complete archiving these data in the Department of Fisheries and Oceans Data Reports for ready availability to government, industry and professional institutions.

6) To publish these 1984/85 - 1987/88 findings in primary journals, in Departmental Technical Reports and Atlas format.

7) To develop and publish recommendations based on these findings, as appropriate, in relation to hydrocarbon development, production and transport; and taking account of emerging results from other NOGAP (and other) sources.

Subprojects:

B.2.1 Completion of Beaufort Shelf fish habitat research. Duration 1984/85 - 1987/88 + 1990/91 - 1993/94.

B.2.3 Completion of nearshore benthic monitoring, Beaufort Shelf.

C.

1. **PROJECT TITLE:**

NOGAP projects B3: Critical Western Arctic Freshwater Habitats. Commenced 1984/85. Approved through 1987/88. Requested 1990/91.

2. **PROJECT MANAGER:**

Dr. Raymond H. Hesslein
Section Leader, Riverine Ecosystems
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Tel. No. (204) 983-5251

3. **OBJECTIVES:**

To complete certain studies initiated but not realized to full potential under Subproject B.3.3 (Fish Habitat Ecology) during the first four years of the NOGAP Program, specifically:

1) To identify, quantify and develop means to monitor environmental and biotic gradients in Mackenzie Delta lakes of significance to the fishery resource and vulnerable to perturbation.

2) To establish the quantitative contribution of Mackenzie Delta lakes to the total bio-energy flow of the Delta and to its fish populations.

3) To develop and test a limnology-fisheries model of habitat function and utilization for the Delta lakes.

Subprojects:

B.3.3A Stable isotope analysis of Arctic char, Arctic cisco, lake whitefish, inconnu, and Arctic grayling.

B.3.3B Application of satellite imagery to monitoring fish habitat in the Mackenzie Delta and Estuary.

D.

1. **PROJECT TITLE:**

NOGAP project B.12 (new): DFO participation in MEMP and BEMP. 1991/92 through 1993/94.

2. **PROJECT MANAGER:**

Gordon D. Kishinsky
Fish Habitat Research Division
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, Manitoba R3T 2N6
Tel. No. (204) 983-5257

3. **OBJECTIVES:**

1) To provide, in conjunction with other government departments, for the continuation of the Mackenzie (MEMP) and Beaufort (BEMP) Environmental Monitoring Programs.

2) To provide for participation of DFO staff in MEMP and BEMP meetings and workshops.

3) To implement research recommendation so the MEMP (1985/86) report in order to build on broad whitefish migration and stock differentiation studies executed under NOGAP B.3.

4) To implement a research recommendation of the BEMP (1985/86) report to inventory NOAA satellite imagery for the Beaufort Sea.

Subprojects:

B.12.1	Continue MEMP (B.12.1A) and BEMP (B.12.1B) programs.
B.12.2	Support DFO participation in MEMP (B.12.2A) and BEMP (B.12.2B) planning, management, and technical workshops.
B.12.3	Implement MEMP research recommendations for broad whitefish.
B.12.3A	Whitefish migration studies.
B.12.3B	Whitefish stock separation.
B.12.4	Publish comprehensive directory of NOAA satellite imagery for the Beaufort Sea region, for the period 1984 to 1986.

E.

1. **PROJECT TITLE**

NOGAP project B.6: Beaufort Sea Oceanography. Duration April 1990 to March 1992.

2. **PROJECT MANAGER:**

R.W. Macdonald
Institute of Ocean Sciences
Department of Fisheries and Oceans
Sidney, B.C.
V8L 4B2
Tel. No. (604) 356-6409

3. **OBJECTIVES:**

The objective of this project is to understand natural hydrocarbon distributions and primary productivity in the hydrocarbon-exploration zone of the Mackenzie Shelf/Estuary. The optimal way to predict impact of projected industrial discharges of hydrocarbons, planned or accidental, is to study and model processes governing natural distributions of the same compounds and to measure transport mechanisms which will tend to concentrate or dilute contaminants within the shelf/estuary system or to move them off the shelf.

Subproject:

None

F.

1. **PROJECT TITLE:**

NOGAP Project B8: Beaufort Sea Waves, 3 years

2. **PROJECT MANAGER:**

J.R. Wilson, MEDS
Department of Fisheries and Oceans
200 Kent Street
Ottawa, Ontario
Tel. No. (613) 990-0264

3. **OBJECTIVES:**

The main objective is to develop a capability to model and describe shallow water wave climate in the near shore area of the Beaufort Sea.

Subproject:

None

ENVIRONMENT CANADA

ENVIRONMENT CANADA

A.

1. PROJECT TITLE:

NOGAP Project C6.1: Reproduction of the Environmental Atlas for Beaufort Sea Oil Spill Response (1990/91).

2. PROJECT MANAGER:

R.S. Howarth
Chief, Environmental Engineering Division
Environmental Protection, N.W.T. District
Environment Canada
P.O. Box 370
Yellowknife, N.W.T. X1A 2N3
Tel. No. (403) 873-3456

Scientific Authority

D.C. Tilden
Hazardous Materials Specialist
Environmental Protection
N.W.T. District

3. OBJECTIVES:

This project will:

1) correct a number of identified errata in the original publication of the "Beaufort Atlas"; and

2) provide copies of the atlas to several hundred individuals and agencies worldwide who have requested copies of the Atlas following primary distribution.

Subproject:

None

B.

1. **PROJECT TITLE:**

NOGAP Project C6.2 : Computer digitization of the Environmental Atlas for Beaufort Sea Oil Spill Response (1991/92).

2. **PROJECT MANAGER:**

R.S. Howarth
Chief, Environmental Engineering Division
Environmental Protection, N.W.T. District
Environment Canada
P.O. Box 370
Yellowknife, N.W.T. X1A 2N3
Tel. No. (403) 873-3456

Scientific Authority

M. Bourque
Hazardous Materials Officer
Environmental Protection
N.W.T. District

3. **OBJECTIVES:**

This project will:

1) Convert the existing Environmental Atlas for Beaufort Sea Oil Spill Response (Beaufort Atlas) into a digitized Geographic Information System (GIS) that is compatible with ESL QUICKMap software;

2) Produce a copy of the GIS Atlas on computer disk;

3) Produce plotted hard copy draft of each digitized map in 8 colour format;

4) Translate the Beaufort Atlas associated graphics into digitized format for on-line retrieval; and

5) Produce a manual of operation for the GIS Atlas.

Subproject:

None

C.

1. **PROJECT TITLE:**

NOGAP Project C4: Environmental Effects of Industry Staging Activities on the Marine Environment (1990/91 - 1991/92).

2. **PROJECT MANAGER:**

Joan Eamer
Manager, Environmental Protection,
Yukon Branch
Environment Canada
100 Hamilton Blvd.
P.O. Box 6010
Whitehorse, Yukon Y1A 5L7
Tel. No. (403) 667-3402

3. **OBJECTIVES:**

One of EP's responsibilities is to protect the quality of the marine environment. To fulfil this responsibility we need to ensure that materials released to the sea through oil and gas development are environmental acceptable. In addition, we need to understand the risks associated with industrial activities in order to ensure that preventative and emergency response measures are adequate. The objectives of this project would be : 1) to assess the extend of contaminant input to the marine environment from the various activities carried out at major industry staging areas in the Beaufort Sea; 2) to assess the risks to the environment associated with these activities; and, 3) to predict the impact of expected increase in use these staging areas.

Subproject:

None

D.

1. **PROJECT TITLE:**

NOGAP Project C23: Predicting impacts of oil spills on migrating eiders and other seabirds in the southern Beaufort Sea (N.W.T.) (1990/91 - 1991/92).

2. **PROJECT MANAGER:**

Jim Hines
Canadian Wildlife Service
Environment Canada
P.O. Box 637
Yellowknife, N.W.T.
X1A 2N5

3. **OBJECTIVES:**

Undoubtedly, the most consequential environmental disaster that could occur in the Beaufort Sea is an oil spill or blow-out during spring when much of the Western Arctic population of seabirds is concentrated in a restricted areas of open water. The objective of the proposed project is to reduce the potential for such a disaster: (1) by determining areas of importance to migrating seabirds (particularly eiders) near the areas of major hydrocarbon developments in the Beaufort Sea, and the annual variability in the use of these areas; (2) by determining numbers of seabirds migrating through the offshore lead system in the southeastern Beaufort Sea in spring, and the timing of this migration; and (3) by deriving models (incorporating the information collected in steps 1 and 2 above) to be used in predicting the spring distribution of seabird populations and, hence, the potential impact of any given hydrocarbon development on the seabirds using the southern Beaufort Sea.

Subproject:

None

E.

1. **PROJECT TITLE:**

NOGAP Project C24: Use of Landsat imagery to determine important areas for shorebirds in the Mackenzie Delta (1991/92 - 1993/94).

2. **PROJECT MANAGER:**

Dr. Cheri L. Gratto
Research Scientist
Canadian Wildlife Service
Environment Canada
115 Perimeter Road
Saskatoon, Saskatchewan S7N 0X4
Tel. No. (306) 975-6128

3. **OBJECTIVES:**

To enable accurate environmental recommendations by Environment Canada regarding oil and gas development in the outer Mackenzie Delta.

To map, using digital analysis methods defined by Dickson et al. (1989. Identification of nesting and staging shorebird areas in the Mackenzie River Delta and Richard Is., N.W.T. using Landsat Thematic Mapper Imagery 1985/87 NOGAP Project
C-7-3, CWS, Edmonton) and verify vegetation communities and priority shorebird nesting and staging habitat in the entire outer Mackenzie Delta.

To determine a habitat map and data base for the Kendall Island subproject.

Subproject:

None

F.

1. **PROJECT TITLE:**

NOGAP Project C7.1: Oil and gas developments in relation to the Kendall Island Migratory Bird Sanctuary (1990/91 - 1993/94).

2. **PROJECT MANAGERS:**

Jim Hines / Bob Ferguson
Canadian Wildlife Service
Environment Canada
P.O. Box 637
Yellowknife, N.W.T. X1A 2N5

3. **OBJECTIVES:**

1) To evaluate the avian populations and habitat in the Kendall Island Migratory Bird Sanctuary (MBS) with a view to reconfiguring the boundaries of the sanctuary;

2) to determine the potential impact of oil and gas development on the bird population and habitats in the Kendall Island Migratory Bird Sanctuary and surrounding areas; and

3) acquire information enabling Environment Canada to make recommendations which would limit the impact of oil and as developments on the migratory bird resources of the Mackenzie Delta.

Subproject:

None

G.

1. **PROJECT TITLE:**

NOGAP Project C7.2: McKinley Bay Sea Duck Monitoring (1990/91 - 1993/94).

2. **PROJECT MANAGER:**

Lynne Dickson
Canadian Wildlife Service
Environment Canada
4999 - 98 Avenue
Edmonton, Alberta T6B 2X3

3. **OBJECTIVES:**

To monitor the effect of offshore oil and gas related activity including harbour development, on the sea ducks that moult in McKinley Bay.

Subproject:

None

H.

1. **PROJECT TITLE:**

NOGAP Project C9: Effects of Beaufort Sea Hydrocarbon Development on the Porcupine Caribou Herd (1990/91 - 1993/94).

2. **PROJECT MANAGER:**

Don Russell
Canadian Wildlife Service
Environment Canada
202-204 Range Road
Whitehorse, Yukon Y1A 3V1
Tel. No. (403) 668-2285

Connie Downes
Terrestorial Ecologist
Environment and Renewable Resources Branch
Indian and Northern Affairs Canada
6th Floor, Les Terrasses de la Chaudière
Hull, Quebec K1A 0H4
Tel. No. (819) 997-9622

3. **OBJECTIVES:**

1) To establish a monitoring program that will relate fluctuations in range quality to fluctuations in physical condition of the Porcupine Caribou Herd.

2) To relate physical condition of caribou to the population dynamics of the herd.

3) To utilize the results of the above to evaluate and refine the existing predictive model as the key management tool in assessing the effects of development on the herd.

Subproject:

None

I.

1. PROJECT TITLE:

NOGAP Project C10: Hydrologic/Hydraulic aspects of northern Hydrocarbon development (1991/92 - 1993/94).

2. PROJECT MANAGER:

J.N. Jasper
N.W.T. Programs Branch
Inland Waters Directorate
Environment Canada
P.O. Box 2970
Yellowknife, N.W.T. X1A 2R2
Tel. No. (403) 920-8503
Fax No. (403) 873-6776

3. OBJECTIVES:

The objective of the project is to produce a delta flow distribution model to improve the assessment of environmental impacts of northern hydrocarbon development by:

1) summarizing existing regional hydrologic and related information;

2) completing development of initial models of the hydrologic and hydraulic behaviour of the Mackenzie Delta; and

3) holding workshops to demonstrate progress on modelling efforts and obtain multi-disciplinary input on further model improvements.

Subproject:

C.10-3 Mackenzie Delta Model (1991/94).

J.

1. **PROJECT TITLE:**

NOGAP Project C11: Sediment-related aspects of northern Hydrocarbon development (1991/92 - 1993/94).

2. **PROJECT MANAGER:**

J.N. Jasper
N.W.T. Programs Branch
Inland Waters Directorate
Environment Canada
P.O. Box 2970
Yellowknife, N.W.T. X1A 2R2
Tel. No. (403) 920-8503 Fax No. (403) 873-6776

3. **OBJECTIVES:**

The objective of the project is to investigate the sediment flux of the Mackenzie River Delta, as a determining factor in stability of delta channels and the Mackenzie Delta/Beaufort Sea coasts, Delta and pro-delta sedimentation, and pathways of sedimentborne contaminants, by:

1) collecting data on Delta sediment input, transport rates at various Delta locations, and near the Beaufort Sea;

2) carrying out historical Delta sedimentation studies;

3) collecting sediment and water quality samples along the lower Mackenzie River Basin and in the Mackenzie Delta and analyzing them for hydrocarbon-related contaminants;

4) carrying out Delta channel stability studies; and

5) using data to develop and calibrate a delta sediment flux model, and assess contaminant pathways in the delta.

Subprojects:

C.11-3 Mackenzie Delta Suspended Sediment Data Program

C.11-4 Mackenzie Delta Sedimentation Study

C.11-5 Contaminants in Mackenzie River/Delta Sediments and Water

C.11-7 Mackenzie Delta Sediment Flux Model

K.

1. **PROJECT TITLE:**

NOGAP Project C17.1: Beaufort Sea - Northern Mackenzie Supplementary Meteorological Data Set 1990/91 - 1991/92 (on going desirable)

2. **PROJECT MANAGER:**

Neil Parker
Atmospheric Environment Service
Environment Canada
4999 - 98 Avenue
Edmonton, Alberta T6B 2X3
Tel. No. (403) 495-3143
Fax No. (403) 468-7916

3. **OBJECTIVES:**

To maintain and upgrade three automatic meteorological stations deployed under NOGAP Project C.17 (1985 - 1987).

To redeploy, to a site in the lower Mackenzie Valley, one of the three stations removed from the original six station network.

To ensure that all data are distributed on the AES meteorological network in real time.

To ensure that all data are quality controlled and place in the AES climatological archives.

Subproject:

None

ENERGY, MINES AND RESOURCES

ENERGY, MINES AND RESOURCES

A.

1. PROJECT TITLE:

NOGAP Project D1: Coastal Zone Geotechnics (Beaufort Sea) 1990/91 - 1992/93).

2. PROJECT MANAGER:

Dr. C.F.M. Lewis
Atlantic Geoscience Centre
Geological Survey of Canada
Energy, Mines and Resources
P.O. Box 1006
Dartmouth, N.S. B2Y 4A2

3. OBJECTIVES:

General

Through geological, geophysical and geotechnical research o the processes taking place ailing the coasts of the Beaufort Sea and on the materials and permafrost features of the coasts, to provide public information concerning the coastal zone as required by government for land use planning and regulation and as required by industry in the design of facilities and activities.

Specific

1) To provide an understanding of rates and processes of coastline change to predict the impact on proposed development.

2) To provide a knowledge base concerning the nearshore bottom materials which will be crossed or excavated or built on in the course of development.

3) To provide a knowledge base concerning the onshore geological materials adjacent to the coast and the associated permafrost conditions that relate to the rate of coastal retreat and the recognition and assessment of geotechnical constraints encountered by onshore coastal engineering works.

4) To acquire a knowledge of ice, wave, current and surge regimes in the costal zone and apply this to an improved understanding of coastal stability, particularly in relation to proposed development.

Subproject:

None

CANADIAN MUSEUM OF CIVILIZATION

CANADIAN MUSEUM OF CIVILIZATION

A.

1. **PROJECT TITLE:**

NOGAP Project F1: Northern Hydrocarbon Archaeology: A coordinated attempt at developing and integrated archaeological resource management system within the NOGAP area. Phase 11 (1990/91 to 1993/94).

2. **PROJECT MANAGER:**

Mailing address:
Jacques Cinq-Mars
Archaeological Survey of Canada
Canadian Museum of Civilization
100 Laurier Street
P.O. Box 3100, Station B
Hull, Quebec J8X 4H2

Workplace:
241 Cité des Jeunes
Asticou Center
Block 1100
Hull, Quebec

3. **OBJECTIVES:**

Continuation of archaeological field inventories and test excavations in the following regions: eastern Yukon coastal Plain and, more specifically the Whitefish Station West area, foothills of the northern segment of the Richardson Mountains, portions of the Anderson Plains, and selected segments of the lower Mackenzie River downstream from Fort Good Hope.

In the Fall of 1990, beginning of the implementation (in collaboration with various partners) of 9 GIS (SPANS) sub-project; at first, this will consist mostly of data entry work and production of first levels maps; experimentation with the production of various research and management derivatives will begin with a pilot study which will make use of some of the already prepared geomorphological information on selected NOGAP sub-areas.

Also in the Fall of 1990, consultations (in coordination and collaboration with pertinent agencies regarding the development of an archaeological resource management plan for the NOGAP area. Input from other departments, agencies and communities will be required in order ensure the complementarity of the latter to other management plans (land-use, environmental impact assessment, etc.).

Subproject:

None

GOVERNMENT OF THE YUKON

GOVERNMENT OF THE YUKON

A.

1. PROJECT TITLE:

NOGAP Project G2: Northern Hydrocarbon Information Acquisition and Process 1991/92 using Landsat TM Satellite Imagery

2. PROJECT MANAGER:

Diane Chisholm
Libraries and Archives
Department of Education
Government of the Yukon
P.O. Box 2703
Whitehorse, Yukon Y1A 2C6
Tel. No. (403) 667-5275

3. OBJECTIVES:

To acquire, catalogue and make available literature and other materials related to hydrocarbon developments north of 60°, within Yukon and the Yukon sector of the Beaufort Sea.

To continue distribution of the two-volume "Beaufort Sea Bibliography" already published under the G-2 project. This will enable Yukoners living outside Whitehorse to have access to the collection. The same information will be available to researchers and government personnel in the Northwest Territories, Alaska and Southern Canada.

To provide support for territorial and municipal governments economic development initiatives and advice to the business community on oil and gas developments.

Subproject:

None

B.

1. **PROJECT TITLE:**

NOGAP Project G-22B: Vegetation Mapping in the Northern Richardson Mountains Using Landsat TM Satellite Imagery.

2. **PROJECT MANAGER:**

Beth Hawkings
Habitat Inventory Coordinator
Fish and Wildlife Branch
Department of Renewable Resources
Government of the Yukon
P.O. Box 2703
Whitehorse, Yukon Y1A 2C6
Tel. No. (403) 667-5281

3. **OBJECTIVES:**

Produce a vegetation map using digital analysis of satellite imagery for the Yukon portion of the northern Richardson Mountains to be used for wildlife and habitat management, and ultimately for impact assessment of hydrocarbon exploration and development.

Assist in developing Yukon expertise in remote sensing (ie. digital analysis) techniques.

Subproject:

None

C.

1. **PROJECT TITLE:**

NOGAP Project G18: North Coast Heritage Research and Protection

2. **PROJECT MANAGER:**

Jeff Hunston, Director
Heritage Branch
Department of Tourism
Government of the Yukon
P.O. Box 2703
Whitehorse, Yukon Y1A 2C6
Tel. No. (403) 667-5363
Fax No. (403) 667-2634

3. **OBJECTIVES:**

To record and salvage, using government and industry resources those sites of importance which will be unavoidably destroyed in the exploration and/or production phases of hydrocarbon development.

To conduct baseline integrative research in order to develop a cultural historical framework against which site-specific hydrocarbon exploration and/or development impacts can be evaluated and site significance identified.

To develop meaningful, effective and efficient policies, guidelines and procedures for the protection and necessary mitigation of significant historic resources in the north Yukon coastal NOGAP area.

To search and assemble archival and site information pertaining to north Coast historic resources for use in a comprehensive and integrated heritage resources management regime.

Subproject:

None

GOVERNMENT OF THE NORTHWEST TERRITORIES

GOVERNMENT OF THE NORTHWEST TERRITORIES

A.

1. **PROJECT TITLE:**

NOGAP Project H1: GNWT NOGAP Coordinator

2. **PROJECT MANAGER:**

Arnold Enge
Hydrocarbon Coordinator
Energy, Mines and Petroleum Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7588
Fax No. (403) 873-0254

3. **OBJECTIVES:**

Ensure the preparedness of the Government of the Northwest Territories to deal with the impact of hydrocarbon production in the Beaufort/Mackenzie Region and its communities.

The continued coordination and management of the GNWT's departmental and regional involvement during the final three years of the NOGAP socio-economic, environmental and technical planning and research program.

Subproject:

None

B.

1. **PROJECT TITLE:**

NOGAP Projects H2 - 1&2: Funds for Tuktoyaktuk and Inuvik Councils to identify Transportation Impacts and Plan for Development.

2. **PROJECT MANAGER:**

Jim Stevens
Senior Transportation Planner
Department of Transportation
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 920-3302

3 **OBJECTIVES:**

To permit the Hamlet of Tuktoyaktuk and the Town of Inuvik to adequately and effectively prepare for and deal with the municipal impacts resulting from Beaufort hydrocarbon development, by providing their Councils with the resources and expertise required to:

1) assess hydrocarbon development proposals;

2) identify and plan for required additional infrastructures and services;

3) modify community development plans, and prepare management strategies to deal with impacts.

Subprojects:

Projects H2-1, and H2-2

H2-2 Funding for Tuk Council to identify transport impacts and plan for development.

C.

1. **PROJECT TITLE:**

NOGAP Project H3: Social Impact Monitoring System

2. **PROJECT MANAGER:**

Vacant
Director
Management Services Division
Department of Social Services
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T.
X1A 2L9
Tel. No. (403) 873-7703

3. **OBJECTIVES:**

This project will review the work done previously on the development of an information system, which was suddenly broken off for lack of funding in March 1988, and explore what is needed to complete this project

This project will be carried out in two stages:

Stage 1 will review the work carried out between 1986 and 1988 on the development of a monitoring system.

Stage 2 will explore how this work could be adapted to current requirements, emphasizing a sufficient but modest approach, based on the manipulation of information currently available in the Social Services program information systems.

Subproject:

None

D.

1. **PROJECT TITLE:**

NOGAP Projects H17 - 1 & 2: Spill Assessment, Response and Disposal Training for Hydrocarbon Spills.

2. **PROJECT MANAGER:**

Ken Hall
Hazardous Substance Specialist
Renewable Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7654

3. **OBJECTIVES:**

To promote and deliver effective environmental protection measures to communities in the N.W.T. in the area of spill assessment, response and disposal.

Main Objectives - Long Term:

1) To develop and implement an advanced level training program in spill response by community and regional spill response personnel to incidents involving hydrocarbons and materials associated with hydrocarbon development.

2) To conduct a review of technology and equipment suitable for disposal of spilled hydrocarbon product and contaminated soils under northern conditions and test their effectiveness.

Sub-Objectives - Short Term:

1) To develop and implement an advanced level spill training program for field staff and community response personnel. The program will include a manual, training materials and an instructional video. Subject areas will include: assessment, investigation, response, safety, material handling, disposal, remediation and enforcement.

2) To review and identify suitable equipment and technology for the disposal of spilled hydrocarbon products and especially contaminated soils.

Subprojects:

A.17-1 Advanced Spill Containment and Clean-up Training Program

A.17-2 Identification, review and assessment of disposal methods for contaminated hydrocarbon materials and soils.

E.

1. PROJECT TITLE:

NOGAP Project H24: Community Health Status Profiles within the Hydrocarbon Development Impact Zones.

2. PROJECT MANAGER:

Ms. Sharon Freitag
Department of Health
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7033

3. OBJECTIVES:

1) To integrate collection of health status information for communities affected by hydrocarbon development through evaluation of health care utilization data. Incidence of specific health conditions in NOGAP communities will be compared to control communities which are not affected by hydrocarbon development. Data on conditions which reflect the social and physical environments will be analyzed.

2) To review an implement an approach to integrate all relevant health database information sources. Procedures for improving and safeguarding data integrity will be developed.

3) To monitor morbidity and mortality trends for 1988 to 1991 and identify unusual illness patterns in NOGAP communities.

Subproject:

None

F.

1. **PROJECT TITLE:**

NOGAP Project H32: Training Northerners in Archaeological Field and Laboratory Techniques

2. **PROJECT MANAGER:**

Charles D. Arnold
Assistant Director, Historic Resources
Prince of Wales Northern Heritage Centre
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 920-8839

3. **OBJECTIVES:**

This project will increase the preparedness of the Government of the Northwest Territories to meet responsibilities arising from the development and transportation of hydrocarbon resources in the Northwest Territories by:

1) Developing capabilities for training northerners in archaeological management and analysis techniques. This will involve hands-on work with archaeological data generated during earlier phases of this NOGAP project.

2) Documenting and testing ethnographic information as an archaeological/historical survey strategy. More specifically, this will involve a training project in techniques of historical research aimed specifically at traditional knowledge of information on the heritage resources of the Beaufort Sea/Mackenzie Delta area.

Subproject:

None

G.

1. **PROJECT TITLE:**

NOGAP Project H43: Safety in Bear Country Program

2. **PROJECT MANAGER:**

John A. Nagy
Supervisor Wildlife Management
Department of Renewable Resources
Government of the Northwest Territories
Inuvik, N.W.T. X0E 0T0
Tel. No. (403) 979-7305

3. **OBJECTIVES:**

This project will increase the preparedness of the Government of the Northwest Territories to meet responsibilities arising from the development and transportation of hydrocarbon resources in the Northwest Territories by:

1) Evaluating and field testing the effectiveness of capsicum sprays, electrical fencing systems, and other bear repellents on polar bears, and evaluating the effectiveness of capsicum repellent sprays and electrical fencing systems on grizzly, black, and polar bears when used in an arctic environment.

2) Incorporating results of field tests into the existing "Detection and Deterrent Training Manual".

Subproject:

None

H.

1. **PROJECT TITLE:**

NOGAP Project H44: Consult on Polar Bear Management Plan

2. **PROJECT MANAGER:**

Susan Bonnyman
Assistant Director, Management
Wildlife Management Division
Department of Renewable Resources
Government of the Northwest Territories
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 920-8064

3. **OBJECTIVES:**

This project will enable the Department of Renewable Resources to develop a detailed polar bear management plan for the Beaufort Sea polar bear population by:

1) Obtaining input on the Draft Northwest Territories Management Plan from the communities which harvest polar bears from the Beaufort Sea polar bear population.

2) Combining the information received during the consultation process with information received from other areas of the N.W.T. into a comprehensive management plan.

3) Discussing the product resulting from the consultation with the communities and obtaining the public support for the implementation of the management plan.

Subproject:

None

I.

1. **PROJECT TITLE:**

NOGAP Project H45: Digital Database of Vegetation Types - Mackenzie Valley Development Corridor

2. **PROJECT MANAGER:**

Steven Matthews
Environmental Assessment Biologist
Wildlife Management Division
Department of Renewable Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7775

3. **OBJECTIVES:**

This project will increase the preparedness of the Department of Renewable Resources to meet its renewable resource management responsibilities arising from the development and transportation of hydrocarbon resources in the Northwest Territories by:

1) Working with personnel from the divisions of Forest Management, Wildlife Management and the Territorial Forest Fire Centre to develop a common digital database of vegetation cover types for use in a geographic information system.

2) Improving the decision making capabilities of the Department of Renewable Resources to respond to all phases (eg. planning, construction, operation and abandonment) of industrial development.

3) Developing expertise in remote sensing and geographic information systems as the Department of Renewable Resources works toward implementing a fully integrated and operational resource information system for the Mackenzie Valley.

Subproject:

None

J.

1. **PROJECT TITLE:**

NOGAP Project H46: Assessment of the Constitutional/Legal Context for Northern Oil and Gas Development

2. **PROJECT MANAGER:**

Bernard W. Funston
Director, Constitutional Law Division
Department of Justice
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 920-8074
Fax No. (403) 873-0173

3. **OBJECTIVES:**

To provide an analysis of the powers and authorities of boards and agencies established under aboriginal claims agreements and their relationship with governmental regulatory powers in the context of oil and gas development. This project would include analysis of governmental and private sector experiences to date with wildlife, land use/access and environmental boards and agencies established by the claims in the context oil and gas development activities. This project will have two components:

1) A report on the jurisdiction, powers and authorities of claims institutions in relation to government in a legal/constitutional context.

2) A review of experiences to date, including a review of major issues and case studies.

Subproject:

None

K.

1. **PROJECT TITLE:**

NOGAP Project H47: Assessment of Market Potential for Alternative Energy Supplies Arising from Mackenzie Delta / Beaufort Sea Development

2. **PROJECT MANAGER:**

Cara McCue
Senior Energy Policy Analyst
Energy, Mines and Petroleum Resources
Government of the Northwest Territories
P.O. Box 1320
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Tel. No. (403) 920-3216
Fax No. (403) 873-0254

3. **OBJECTIVES:**

This project will assist Northerners in the maximization of energy benefits resulting from oil and/or gas development in the Mackenzie Delta/Beaufort Sea by:

1) Establishing the data base and undertaking the basic research and analysis necessary to identify and evaluate, at an early stage in the project planning process, the options for new energy supplies which could become available to communities in the Northwest Territories as a result of oil and/or gas development in the Mackenzie Delta/Beaufort Sea, and determine which options could best meet communities' energy requirements and

2) Integrating the results of this evaluation into the oil and gas companies' planning process to ensure that the infrastructure for the preferred energy options is actually incorporated into the design of production and transmission facilities.

Subproject:

None

L.

1. **PROJECT TITLE:**

NOGAP Project H48: Review and Assessment of the Norman Wells Experience and Application to Future Hydrocarbon Development

2. **PROJECT MANAGER:**

Lorne Matthews
Director, Regional Planning
Energy, Mines and Petroleum Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7588
Fax No. (403) 873-0254

3. **OBJECTIVES:**

1) To record, assess and evaluate government, industry, union, contractor, community and special interest group experiences gained during the project approval, preparation, construction and post construction phases of the Norman Wells field development and the IPL pipeline project.

2) To review, confirm and incorporate Beaufort Sea EARP Panel recommendations.

3) Identify the lessons/recommendations which should be applied directly to the Beaufort-Delta Gas development and Mackenzie Valley pipeline construction project in order to minimize problems and maximize benefits from the development with a focus on the social, economic, environmental and management regimes.

Subproject:

The study will address areas where many federal and territorial departments are involved and where past NOGAP work has been undertaken. There are close linkages with the NOGAP Project H49, Identification of Employment, Business and Training Opportunities Created by Beaufort Delta Hydrocarbon Development.

M.

1. PROJECT TITLE:

NOGAP Project H49: Identification of Business, Employment and Training Opportunities Created by Beaufort Delta Hydrocarbon Development

2. PROJECT MANAGER:

Lorne Matthews
Director, Regional Planning
Energy, Mines and Petroleum Resources
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, N.W.T. X1A 2L9
Tel. No. (403) 873-7588
Fax No. (403) 873-0254

3. OBJECTIVES:

This project will provide critical employment and business demand-side information and develop the database and information linkages necessary to enable the GNWT to prepare Human Resource and Business Development Plans. It will help GNWT to meet its mandate by identifying training and other employment and business support requirements to maximize participation by N.W.T. residents and businesses in Beaufort-Delta gas development and Mackenzie Valley pipeline construction. The project will prepare GNWT for hydrocarbon development by maximizing northern involvement and ensuring that maximum benefits flow to the north from hydrocarbon development.

1) Identify direct and indirect employment and business opportunities throughout all phases of development.

2) Identify the nature and special characteristics of each opportunity (skill and education requirement, timing, location duration etc).

3) Incorporate opportunities information in a data base so that it can be linked with other GNWT/industry/Federal Supply-Demand information systems and used to identify training and other support requirements to ensure maximum benefits to northerners. The employment database would group opportunities information according to job type, occupational area, skill level, and educational level, as well as the phase of development in order to target those jobs which are most accessible and maximize benefits to Northern residents.

4) Develop a strategy including recommendations on timing and additional requirements to enable the responsible departments to do their own internal work and move from a data base to Human Resources and Business Development Plan.

Subproject:

None

N.

1. **PROJECT TITLE:**

NOGAP Project H50: Public Involvement Options for Resource Development Decision Making

2. **PROJECT MANAGER:**

Lorne Matthews
Director, Regional Planning
Energy, Mines and Petroleum Resources
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Tel. No. (403) 873-7588
Fax No. (403) 873-0254

3. **OBJECTIVES:**

This project is intended to ensure effective public participation at the regional and community level, in resource development decision making. To do this the study will build on the GNWT Resource Development Policy and will focus on existing and future potential DIZ type groups. It will improve the understanding of the benefits of public involvement and commitments to DIZ and will increase public capability to deal effectively and responsibly with resource development issues.

The intention is to ensure that when development occurs and decisions are required, an effective, capable and responsible network of DIZ or similar regional, community based mechanisms will be in place so that they can participate effectively in resource development decision making. These groups will provide the sounding board to enable industry, federal and territorial government to make solid, publicly supported decisions.

Subproject:

None